Fujitsu Semiconductor (Shanghai) Co., Ltd.
Application Note

MCU-AN- 500017-E-11

F²MC-8FX FAMILY

8-BIT MICROCONTROLLER

MB95200 SERIES

HOW TO MAKE PRPGRAMMING ON TARGET BOARD

APPLICATION NOTE

FUJITSU

Revision History

Date	Author	Change of Records
2009-2-10	Benjamin. Yang	V1.0, First draft
2009-2-11	Benjamin. Yang	V1.1, Modify
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This manual contains 17 pages.

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1 Introduction

Programming to target board is a very important step for project design. This document shows you how to make programming to target board. In this part, you can realize the programming function process.

The programming interface in this document could be used as an in-circuit debug and in-circuit programming tool.

2 Application Environment

This chapter introduces the application environment of MB95200H/210H SOP20 PGM adaptor.

2.1 Programming Tool

The debug tool is BGMA (BGM Adaptor), the type of it is MB2146-08-E, as below picture. It can be gotten from MB95200 MCU Starter Kit (PN: MB2146-410-01-E).

Figure 2-1 BGM Adaptor

2.2 SOFTUNE

SOFTUNE is used to program and debug, as software development environment. The version of it is F2MC-8L/8FX SOFTUNE Workbench V30L31, as below picture. It can be gotten from MB95200 MCU Starter Kit (PN: MB2146-410-01-E), or downloaded from website: http://www.fujitsu.com/cn/fss/services/mcu/tools.html

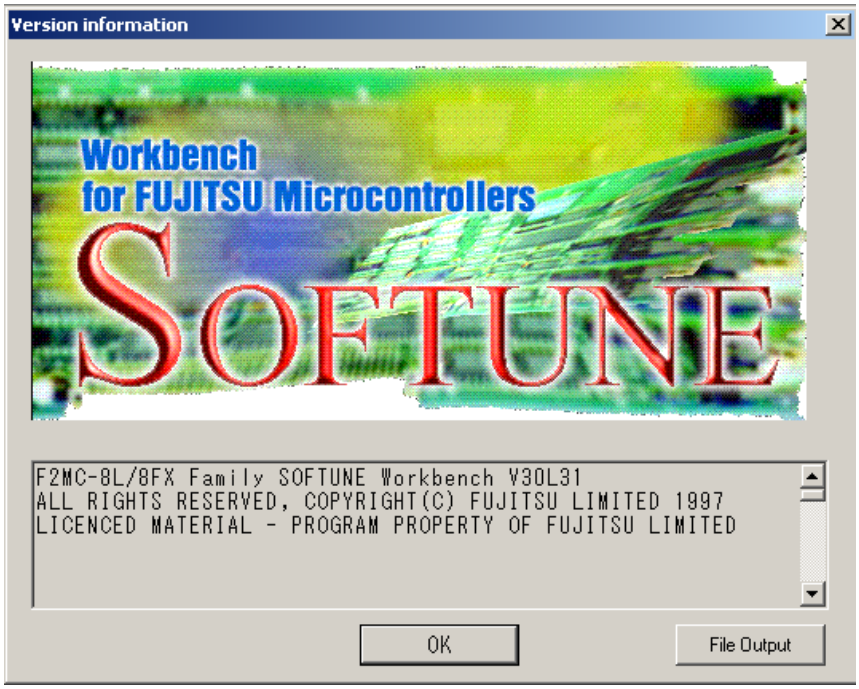


Figure 2-2 SOFTUNE Version

2.3 USB Programmer

The MB95200 series USB programmer is as below picture. It can be downloaded from Web: http://www.fujitsu.com/cn/fss/services/mcu/tools.html

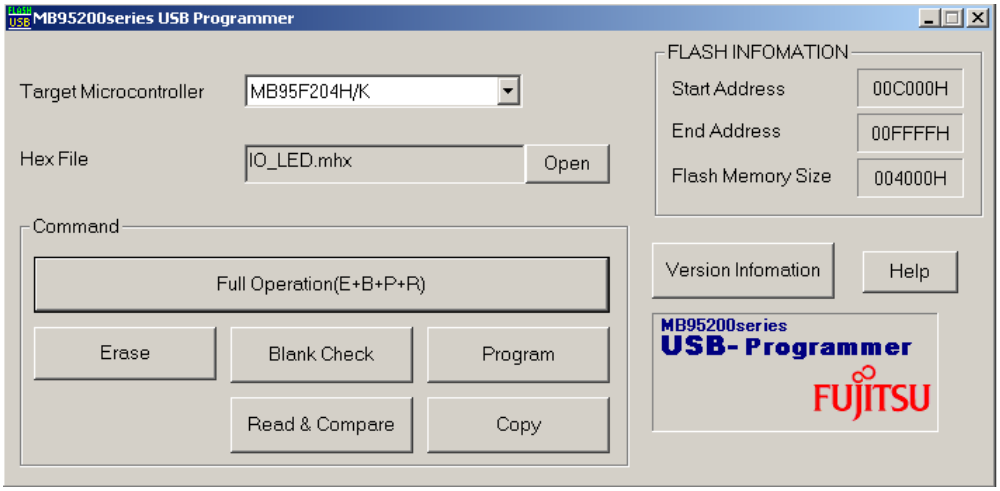


Figure 2-3 MB95200 Series USB Programmer

3 MCU Products

This chapter introduces MCU product which is suit to this document.

This in-circuit programming circuit have some differences between single flash MCU and dual flash MCU. This part will list you the two types of MCU as follow.

Table 3-1 MCU Products

Series	Flash Type	Chip list	Series	Flash Type	Chip list
MB95F200H	Single Flash	MB95F202K	MB95F260H	Dual Flash	MB95F262K
		MB95F202H			MB95F262H
		MB95F203K			MB95F263K
		MB95F203H			MB95F263H
		MB95F204K			MB95F264K
		MB95F204H			MB95F264H
MB95F210H	Single Flash	MB95F212K	MB95F270H	Dual Flash	MB95F272K
		MB95F212H			MB95F272H
		MB95F213K			MB95F273K
		MB95F213H			MB95F273H
		MB95F214K			MB95F274K
		MB95F214H			MB95F274H
MB95F220H	Single Flash	MB95F222K	MB95F280H	Dual Flash	MB95F282K
		MB95F222H			MB95F282H
		MB95F223K			MB95F283K
		MB95F223H			MB95F283H
					MB95F284K
					MB95F284H
			MB95F330H	Dual Flash	MB95F332K
					MB95F332H
					MB95F333K
					MB95F333H
					MB95F334K
					MB95F334H

4 Hardware Design

This chapter introduces programming steps using either MB95200 series USB programmer or F2MC-8L/8FX SOFTUNE Workbench V30L31.

As Chapter 3 shows that the MCUs have two types, the debug circuit have any differences. This chapter will give you the different types MCU programming circuit.

4.1 Single Flash MCU Programming Circuit

The follows figure shows the circuit diagram of the in-system programming interface. To design this in-system programmer interface, we need four pins, UVCC_EV, GND, RSTIN, and DBG. (RST_OUT if necessary, please add it).

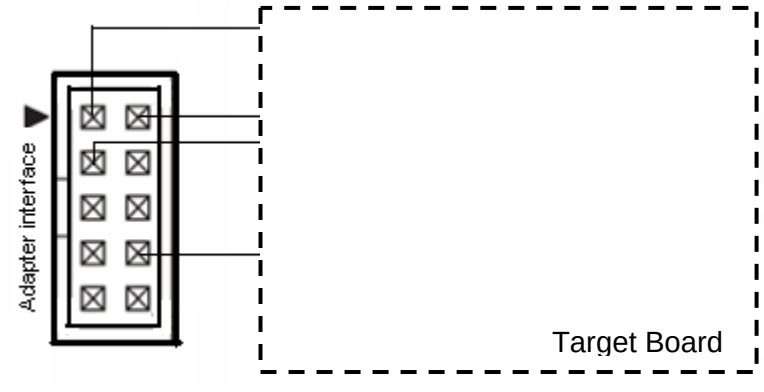


Figure 4-1 Basic Circuit for Single Flash MCU

Components Recommendation:

D1: VF < 0.3V when IF = 1mA. E.g. LL103A, 1SS294

Following list shows the functions of the interface connector.

(1) J1 is a 10 pins connector which is the interface of this circuit.

(2) The write voltage (VCC = 4.5V to 5.5V) is supplied from the user system. UVCC_EV and DBG pin timing controls the PGM mode entry.

(3) Pin2 of the connector used to connect the GND.

(4) Programmer provides 10V directly to RSTX pin during flash erase/write operation. If it is pulled high in user system, please consider to add a low-drop diode for separate H voltage.

(5) DBG pin provides 1-line UART communication with the Programmer. Serial write mode can be set if provide special timing of DBG and VCC pin.

4.2 Dual Flash MCU Programming Circuit

The follows figure shows the circuit diagram of the in-system debug interface. To design this in-system programmer interface, we need three pins, UVCC_EV, GND and DBG. (RST_OUT if necessary please add)

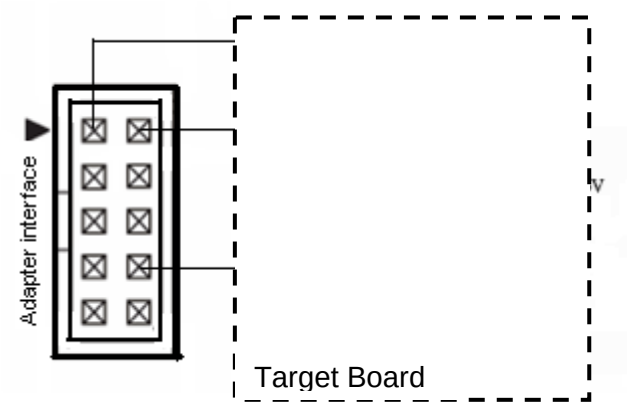


Figure 4-2 Basic Circuit for Single Flash MCU

Components Recommendation:

D1: VF < 0.3V when IF = 1mA. E.g. LL103A, 1SS294

Following list shows the functions of the interface connector.

(1) J1 is a 10 pins connector which is the interface of this circuit.

(2) The write voltage (VCC = 4.5V to 5.5V) is supplied from the user system. UVCC_EV and DBG pin timing controls the PGM mode entry.

(3) Pin2 of the connector used to connect the GND.

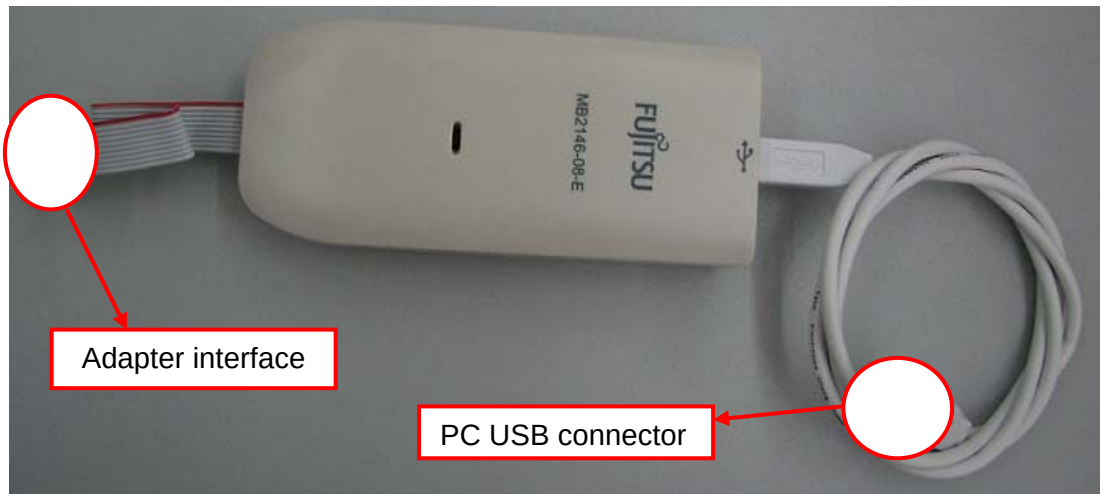
(4) DBG pin provides 1-line UART communication with the Programmer. Serial write mode can be set if provide special timing of DBG and VCC pin.

5 Programming Process

5.1 Use MB95200 Series USB Programmer to Program

5.1.1 Hardware Connection

(1) Connect BGM adapter with computer by USB, then connect it with target board.



(2) Power up MCU on the target board. Please note: user must give the power supply to the target board after connecting target board with BGM adaptor.

5.1.2 Programming Step

(1) Open MB95200 series USB programmer

(2) Select MCU type

(3) Select mhx file at the path: Current project DIR\Debug\ABS

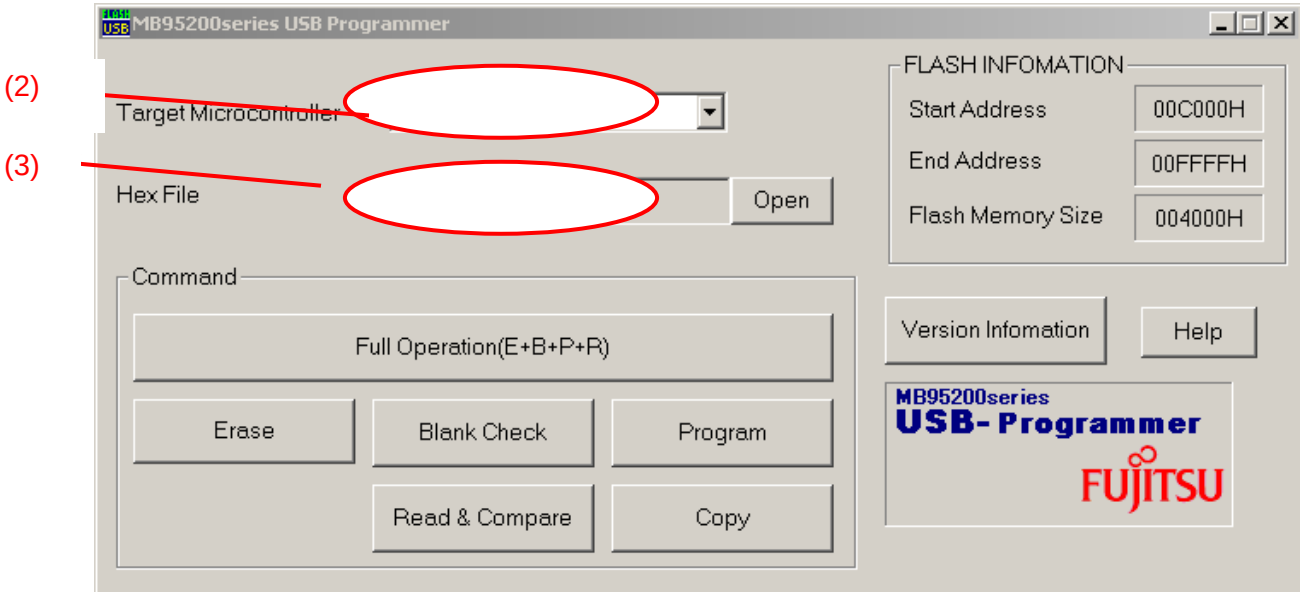


Figure 5-1 Select MCU Type and Hex File

(4) Click **Full Operation** to do programming.

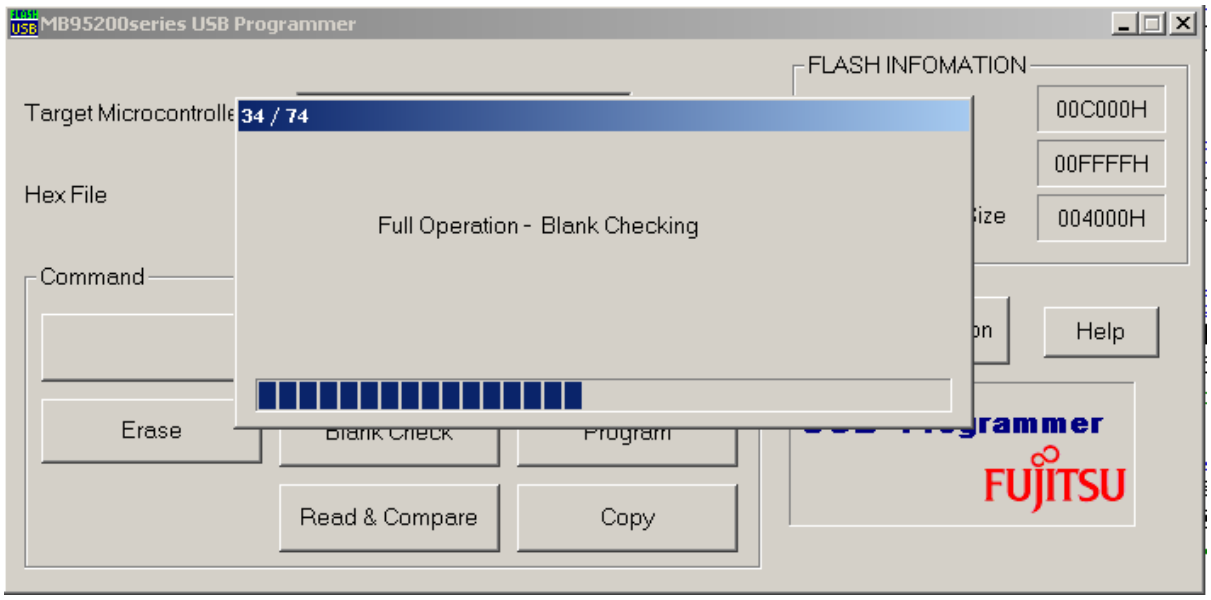


Figure 5-2 Click Full Operation

(5) The USB programmer also provides single operation, including Erase, Blank Check, Program, Read & Compare and Copy.

5.2 Use F2MC-8L/8FX SOFTUNE to Program

(1) Connect BGMA to PC

(2) Connect EV-board to BGMA

(3) Power on the EV-board

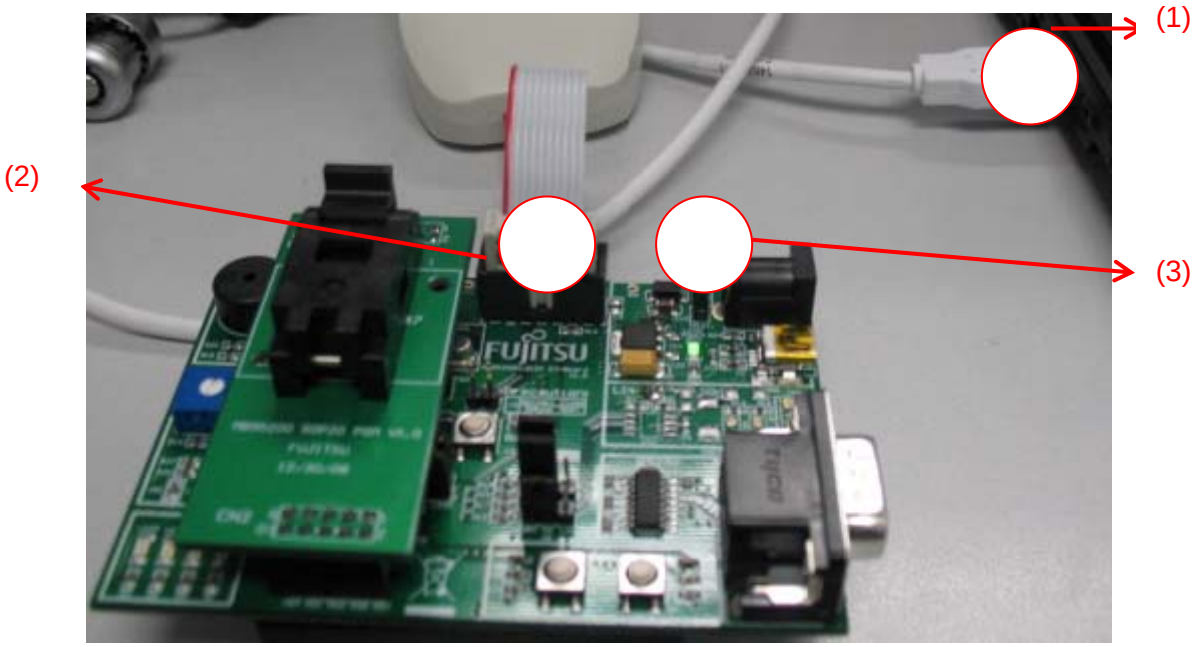


Figure 5-3 Indicate Process 1-3

(4) Open a project (E.g. IO_LED) using SOFTUNE

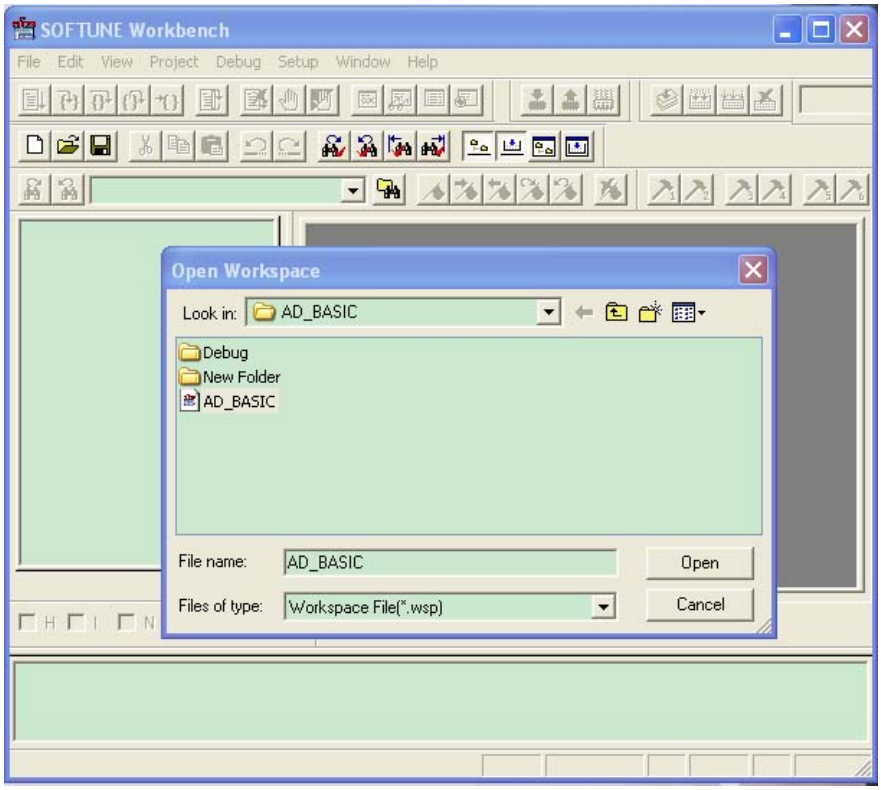


Figure 5-4 Open Demo Project

(5) Start debug.

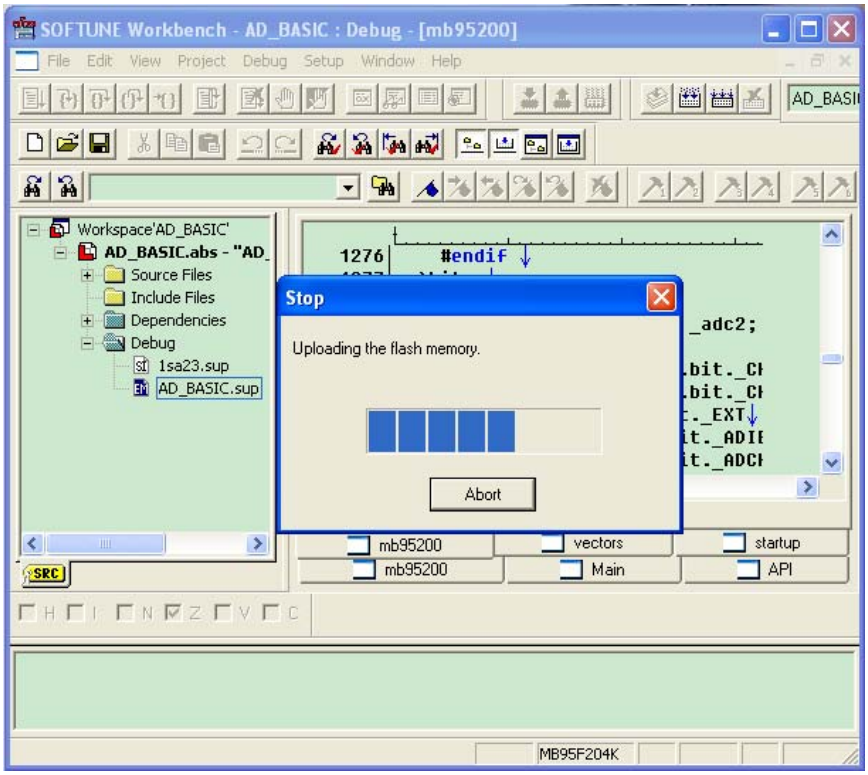


Figure 5-5 Start Debug

(6) Run a step, and the system begin to program. (Press F5 or F6 on the keyboard or click step in or step over in the workbench)

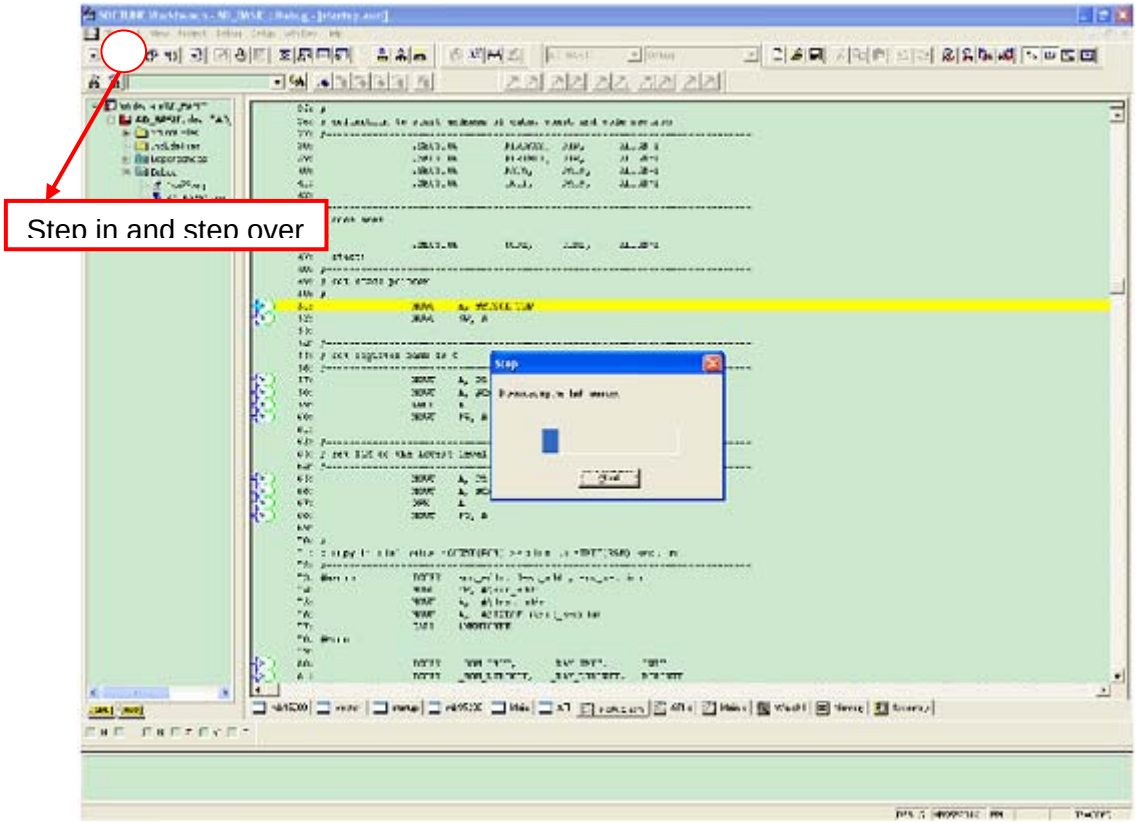


Figure 5-6 Begin to Program

Note: SOFTUNE will change watchdog bit in MCU with watchdog setting(as follows), but USB programmer (include dedicated software) will not, so when use SOFTUNE to debugging and programming, please pay more attention on watchdog setting, below are 2 conditions to use watchdog:

1. Use SOFTUNE debugging and programming:

-Set SOFTUNE watchdog setting the same as code setting, enable or disable

2. Use USB programmer (include dedicated software) to programming:

-Just enable watchdog or disable watchdog in code.

For how to use watchdog, please refer to “MCU-AN-500013-E-11 (Watchdog Timer Application Note)”

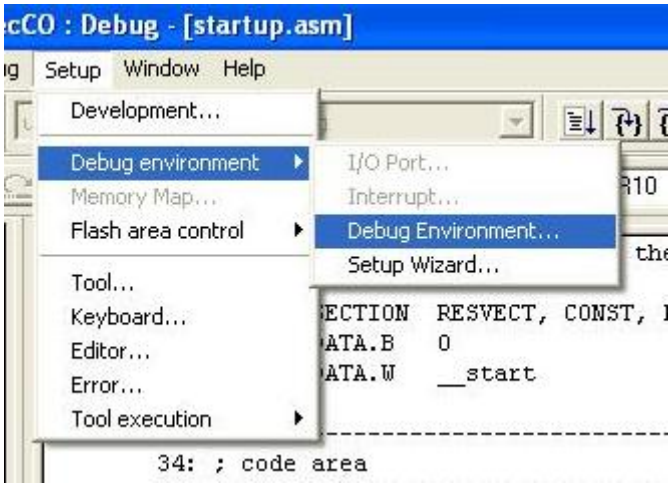


Figure 5-7 Watchdog Setting Menu

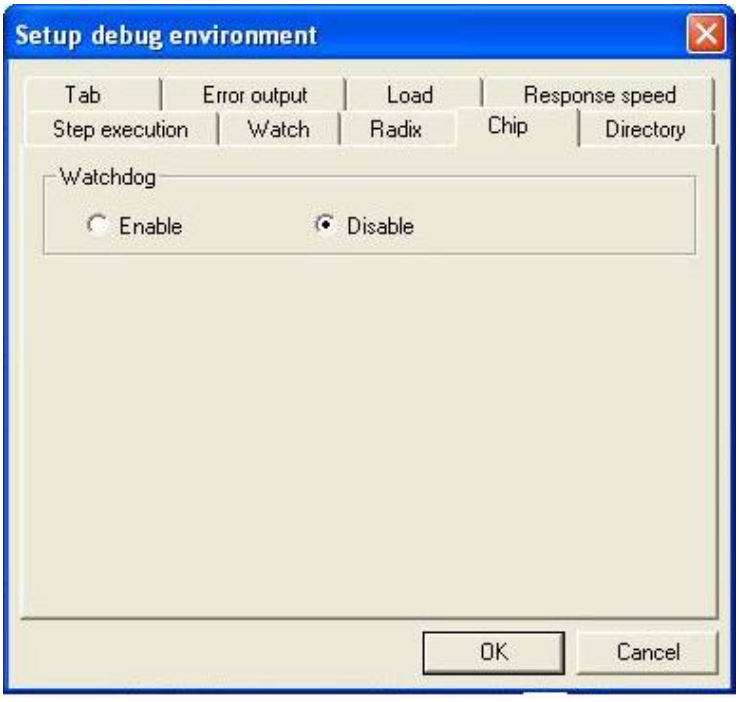


Figure 5-8 Watchdog Setting Option

6 Trouble Shooting

6.1 Solve the Error Message Window from USB Programmer

(1) When using the USB programmer, please choose the right target microcontroller type. Or error occurs as below.

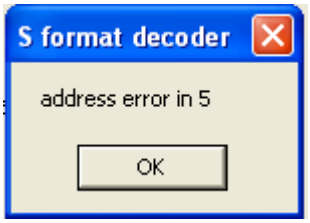


Figure 6-1 Error about MCU Selection

(2) When user connects the power supply before BGM adapter connector, the error as below will occur.

Figure 6-2 Error about Connecting Order by Using USB Programmer

6.2 Solve the Error Message Window from SOFTUNE

(1) When user connects the power supply before BGM adapter connector, the error as below will occur.

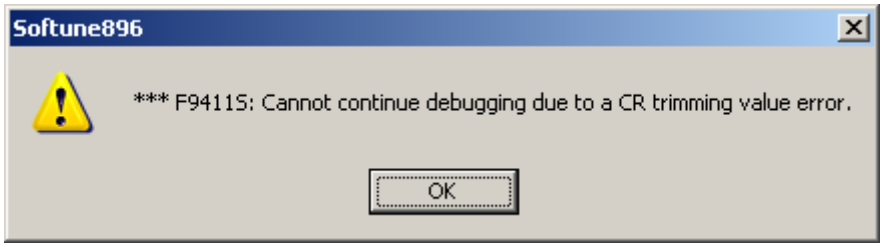


Figure 6-3 Error about Connecting by Using SOFTUNE

7 Additional Information

For more information about how to use MB9595200H/210H EV-board, BGM Adaptor and SOFTUNE, please refer to SKT MB2146-410-01-E User Manual, or visit following websites:

English version:

http://www.fujitsu.com/cn/fsp/services/mcu/mb95/application_notes.html

Simplified Chinese Version:

http://www.fujitsu.com/cn/fss/services/mcu/mb95/application_notes.html

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